Technical Report 1233

Performance Appraisal Feedback: A Foundation for Effective Self-Development

Karin A. Orvis
Old Dominion University
Consortium Research Fellows Program

June 2008

**United States Army Research Institute
for the Behavioral and Social Sciences**

Approved for public release; distribution is unlimited.

U.S. Army Research Institute
for the Behavioral and Social Sciences

A Directorate of the Department of the Army
Deputy Chief of Staff, G1

Authorized and approved for distribution:

Michelle Sams

MICHELLE SAMS, Ph.D.
Director

Technical review by

Dr. James Belanich, U.S. Army Research Institute
Dr. Sena Garven, U.S. Army Research Institute

NOTICES

DISTRIBUTION: Primary distribution of this Technical Report has been made by ARI. Please address correspondence concerning distribution of reports to: U.S. Army Research Institute for the Behavioral and Social Sciences, Attn: DAPE-ARI-ZXM, 2511 Jefferson Davis Highway, Arlington, Virginia 22202-3926.

FINAL DISPOSITION: This Technical Report may be destroyed when it is no longer needed. Please do not return it to the U.S. Army Research Institute for the Behavioral and Social Sciences.

NOTE: The findings in this Technical Report are not to be construed as an official Department of the Army position, unless so designated by other authorized documents.

REPORT DOCUMENTATION PAGE

1. REPORT DATE (dd-mm-yy) June 2008	2. REPORT TYPE Final	3. DATES COVERED (from. . . to) August 2004 - May 2007

4. TITLE AND SUBTITLE

Performance Appraisal Feedback: A Foundation for Effective Self-Development

5a. CONTRACT OR GRANT NUMBER

5b. PROGRAM ELEMENT NUMBER
633007

6. AUTHOR(S)

Karin A. Orvis (Old Dominion University)

5c. PROJECT NUMBER
A792

5d. TASK NUMBER
214

5e. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
U.S. Army Research Institute for the Behavioral and Social Sciences
Basic Research Unit
2511 Jefferson Davis Highway
Arlington, VA 22202-3926

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
U.S. Army Research Institute for the Behavioral and Social Sciences
2511 Jefferson Davis Highway
Arlington, VA 22202-3926

10. MONITOR ACRONYM
ARI

11. MONITOR REPORT NUMBER
Technical Report 1233

12. DISTRIBUTION/AVAILABILITY STATEMENT

Approved for public release; distribution is unlimited.

13. SUPPLEMENTARY NOTES

Subject Matter POC: Karin Orvis

14. ABSTRACT *(Maximum 200 words)*:

The U.S. Army's Leader Development Program relies on three development methods: institutional training and education, operational assignments, and self-development. The value of a self-development as a means for employee development has also been recognized in the private sector as well as in other public organizations. Unfortunately, empirically-based evidence concerning how the Army (and other organizations) can support and enhance employee self-development efforts is far from comprehensive. Prior research examining self-development in the public and private sector has focused on factors that stimulate the quantity of self-development participation. Yet, meaningful development in an individual's job knowledge and skills is contingent on the quality of self-development activities in which one participates, not simply the quantity of self-development. The present study developed and tested a model of the effects of supervisory performance appraisal feedback on the quality of employees' self-development choices. Data collected generally supported the model. Results suggest that supervisory feedback shapes the quality of an employee's subsequent self-development choices both directly and indirectly through its influence on employee self-regulation. Furthermore, results suggest that the attributes of feedback combine both additively and multiplicatively to influence self-regulation. Implications for fostering self-development in the Army are discussed.

15. SUBJECT TERMS
Self-development, performance feedback, self-regulation, performance assessment, development, self-evaluation, self-efficacy, self-dissatisfaction, learning goal orientation

SECURITY CLASSIFICATION OF			19. LIMITATION OF ABSTRACT	20. NUMBER OF PAGES	21. RESPONSIBLE PERSON
16. REPORT	17. ABSTRACT	18. THIS PAGE			
Unclassified	Unclassified	Unclassified	Unlimited	43	Ellen Kinzer Technical Publication Specialist 703-602-8047

Technical Report 1233

Performance Appraisal Feedback: A Foundation for Effective Self-Development

Karin A. Orvis
Old Dominion University
Consortium Research Fellows Program

Basic Research Unit
Paul Gade, Chief

U.S. Army Research Institute for the Behavioral and Social Sciences
2511 Jefferson Davis Highway, Arlington, Virginia 22202-3926

June 2008

Army Project Number **633007A792**	**Personnel, Performance and Training**

Approved for public release; distribution is unlimited.

ACKNOWLEDGEMENT

This research represents my dissertation research which was completed to partially fulfill the requirements for the degree of Doctor of Philosophy in the Department of Psychology at George Mason University. I would like to express my appreciation to the U.S. Army Research Institute for the Behavioral and Social Sciences and the Consortium Research Fellows Program, especially Dr. Paul Gade and Dr. Robert Ruskin, for helping to support this dissertation research.

I would like to thank Dr. James Belanich (ARI, Research and Advanced Concepts Unit) and Dr. Sena Garven (ARI, Leader Development Research Unit) for their comments and suggestions on this technical report. I also greatly appreciate the feedback received on earlier versions of this paper from Dr. Jose Cortina, Dr. Stephen Zaccaro, and Dr. Paige Wolf (George Mason University). Finally, I thank Tiffany Bludau, Lisa Gulick, Laura Fields, Krista Langkamer, and Dr. Laura Mullin for their assistance in coding the qualitative data involved in this research, as well as Siria Rioja for her assistance with data entry.

Portions of the findings of this research were presented at the July 2007 meeting for the Personnel Testing Council of Metropolitan Washington, DC. Information concerning the theoretical model was also disseminated at the Annual Conference of the Society for Industrial/Organizational Psychology in May 2006.

PERFORMANCE APPRAISAL FEEDBACK:
A FOUNDATION FOR EFFECTIVE SELF-DEVELOPMENT

EXECUTIVE SUMMARY

Research Requirement:

The U.S. Army's approach to leader development relies on three development methods: institutional training and education, operational assignments, and self-development. The value of self-development as a means for employee development has been recognized in the private sector as well as in other public organizations. Unfortunately, empirically-derived knowledge concerning effective self-development practices has not kept pace with the increased interest placed on self-development. Accordingly, research is needed in a number of areas related to self-development, particularly with respect to self-development in the Army and other public sector organizations.

Prior research on self-development (both in the public and private sector) has focused on factors that impact the quantity of self-development participation. Yet, meaningful development in an individual's job knowledge and skills is contingent on the quality of self-development activities, not simply the quantity of self-development. In order to maximize the effectiveness of self-development, organizations (including the U.S. Army) must understand the factors that influence the appropriateness (i.e., quality) of employee self-development choices.

Self-development literature suggests that supervisors/leaders may have the capability to guide and support subordinate self-development choices by providing performance feedback. Further, different attributes of feedback have been found to influence the consequences of a feedback message. Research has consistently acknowledged three content attributes on which feedback may vary: behavioral focus, development focus, and severity. These attributes impact the degree to which feedback is perceived as credible, motivates a desire for behavioral change, and generates such change. Accordingly, the present research developed and tested a model of the effects of the content attributes of supervisory performance appraisal feedback on the quality of employees' self-development choices. In particular, this model proposed that the influence of the feedback attributes on the quality of an employee's self-development choices is mediated through their effect on several employee self-regulatory processes.

Procedure:

Participants included 149 employees recruited from a large-size fire department. Data were gathered directly from the employee, his/her supervisor, and the employee's annual performance feedback evaluation report. Employees voluntarily completed a questionnaire which assessed their self-regulatory processes and the self-development activities in which they engaged since receiving their most recent performance evaluation. Next, an evaluation of the participant's specific job knowledge and skills in need of development was completed by his/her supervisor. Finally, data were gathered from the employee's performance evaluation report.

Findings:

This research found considerable variability in the quality of employees' self-development choices and behaviors. This suggests that it is insufficient to focus only on quantity of self-

development. Second, the findings of this research demonstrate that variability in quality across employees is explained, in part, by the attributes of supervisory performance appraisal feedback received. The results suggest that the mechanisms by which these attributes influence employee self-development choices are more complex than originally suspected; supervisory feedback shapes the quality of an employee's subsequent self-development choices both directly and indirectly through its influence on employee self-regulation. Furthermore, the attributes of feedback combine both additively and multiplicatively to influence employee self-regulation. The third contribution of this research is that performance appraisal feedback from one's supervisor was found to significantly contribute to the quality of self-development choices even after accounting for the effects of the employee's level of learning goal orientation. This finding is of value because learning goal orientation has repeatedly been found to be a key determinant of individuals' learning-related cognitions and behaviors.

Utilization and Dissemination of Findings:

Army personnel have indicated that a greater level of organizational support is necessary to ensure that the Army self-development system is effective (Bryant, 1994; Snow, 2003). The provision of performance appraisal feedback is one type of organizational support that may facilitate effective self-development in the Army. Specifically, supervisory feedback can help Soldiers accurately identify particular knowledge or skills in need of improvement. Performance feedback can also aid Soldiers in developing a specific plan of action regarding the particular self-development activities to pursue in order to develop these identified weaknesses. These results may provide guidance concerning the best practices/techniques for providing supervisory feedback in order to enhance the quality of Soldiers' self-development. Such information could be used to develop the instructional content of performance appraisal training for Army leaders.

This research found that providing employees with specific suggestions for future development goals and recommendations of particular self-development activities improved the quality of employees' subsequent self-development activity choices. Specifically, employees who received development-focused feedback participated in self-development activities higher in content relevancy, learner engagement, challenge, and structure. Given this direct influence of development-focused feedback on self-development quality, it may be particularly valuable to keep leaders informed concerning quality development resources available in the Army. Thus, leaders should have a "pool" of high quality resources from which to draw when providing subordinates with appropriate self-development activity suggestions.

Recommendations for the Army:

- Provide leaders with training on writing and delivering effective performance evaluations.
- Brief all Soldiers on the characteristics of a quality development activity.
- Disseminate information to all Soldiers about development opportunities available.

Recommendations for Army Leaders:

- When giving performance feedback:
    - Include specific task-based examples of the employee's strengths and deficiencies.
    - Include specific suggestions of future development goals and self-development activities the employee could complete to address their performance weaknesses.

  - Discuss both the employee's performance weaknesses and strengths; limit critique of weaknesses to 2-3 priority areas.
- Encourage subordinates to self-develop and provide recognition to those who self-develop.

PERFORMANCE APPRAISAL FEEDBACK:
A FOUNDATION FOR EFFECTIVE SELF-DEVELOPMENT

CONTENTS

Page

INTRODUCTION 1

Purpose of the Present Research 2
Attributes Reflecting High Quality Instruction 3
Influence of Performance Feedback Attributes on Self-Development Quality via Self-Regulation 4
Self-Regulatory Processes 4
Influence of Self-Regulatory Processes on Self-Development Activity Quality Choices 6
Influence of Supervisory Feedback Attributes on Employee Self-Regulation and Self-Development 8

METHOD 11

Participants and Procedure 11
Performance Feedback Content Attribute Measures 11
Self-Regulatory Process Measures 12
Self-Development Activity Quality Attribute Measures 13
Individual Difference Covariate – Learning Goal Orientation 13
Analytic Strategy 14

RESULTS 14

Descriptive Statistics 14
Model Assessment 14

DISCUSSION 20

Limitations and Future Research Directions 21
Implications for the U.S. Army 22
Conclusion 24

REFERENCES 25

APPENDIX 35

Page

LIST OF TABLES

TABLE 1. MEANS, STANDARD DEVIATIONS, AND CORRELATIONS FOR RESEARCH VARIABLES 15

LIST OF FIGURES

FIGURE 1. HYPOTHESIZED MODEL OF THE INFLUENCE OF SUPERVISORY PERFORMANCE FEEDBACK ON EMPLOYEE SELF-DEVELOPMENT QUALITY 5

FIGURE 2. HYPOTHESIZED MODEL – STANDARDIZED PATH COEFFICIENT 17

FIGURE 3. FINAL MODEL OF THE INFLUENCE OF SUPERVISORY FEEDBACK ON SELF-DEVELOPMENT QUALITY – STANDARDIZED PATH COEFFICIENT 19

FIGURE 4. BEHAVIORAL FOCUS AND SEVERITY INTERACTION FOR SELF-EVALUATION ACCURACY 20

FIGURE 5. DEVELOPMENT FOCUS AND SEVERITY INTERACTION FOR SELF-EVALUATION ACCURACY 20

PERFORMANCE APPRAISAL FEEDBACK:
A FOUNDATION FOR EFFECTIVE SELF-DEVELOPMENT

INTRODUCTION

DA PAM 350-58 Leader Development for America's Army – The Enduring Legacy (1994) describes the U.S. Army's overall approach to leader development as accomplished by three types of developmental opportunities: institutional training and education, operational assignments, and self-development. The value of self-development as a means for employee development has also been recognized in the private sector as well as in other public organizations (Pescuric & Byham, 1996). Self-development is defined as the total of all deliberate activities, not formally required by the organization, that an employee undertakes in order to gain and retain specific job-related knowledge and skills (Tough, 1978).

Empirically-derived knowledge concerning effective self-development practices has not kept pace with the increased interest/emphasis placed on self-development. Further, in regard to the U.S. Army, the Army Training and Leader Development Panel (ATLDP Office Chief of Staff of the Army, 2001) and other Army personnel (e.g., Bryant, 1994; Snow, 2003) have indicated that the self-development component of the Army leadership development program is most in need of augmentation and that a greater level of organizational support is necessary to ensure that the Army leader self-development system is effective. Thus, additional research on self-development would be quite advantageous, particularly with respect to identifying factors which influence self-development participation in the Army and other organizations in the public sector (Boyce, Wisecarver, & Zaccaro, 2005).

Prior work that has examined self-development (both in the public and private sector) has focused on identifying antecedents that stimulate the quantity of employee self-development participation (e.g., Birdi, Allen, & Warr, 1997; Boyce, 2004; Hazucha, Hezlett, & Schneider, 1993; Maurer, Mitchell, & Barbeite, 2002; Maurer & Tarulli, 1994; Noe, 1996; Noe & Wilk, 1993). While an emphasis on the prediction of the quantity of self-development activities in which an employee participates is valuable, assessment and prediction of the *quality* of self-development - the degree to which this participation is likely to produce meaningful changes in one's job knowledge/skills - is critical. If an employee participates in several activities but doesn't develop the knowledge/skills that are in need of development, one could argue the self-development activities were not worthwhile to the organization or employee. In contrast, participation in a single activity would be quite significant if it ameliorated the employee's job weaknesses. Thus, it is important to understand factors that influence the quality of self-development activities in which an employee participates. While the value of self-development quality has been acknowledged (Brookfield, 1984; 1985; Caffarella & O'Donnell, 1991; Coolican, 1974), little research has been directed toward it.

In contrast, the quality of a *formal* training or development activity has been the focus of a great deal of research. Numerous literature reviews on training and instructional design, as well as primary empirical research studies, have consistently stressed four instructional design attributes (i.e., content relevancy, learner engagement, challenge, and structure) that contribute to the effectiveness of formal training and development (Campbell & Kuncel, 2001; Gagne &

Medsker, 1996; Goldstein & Ford, 2002; Kraiger, 2003; McCauley, Eastman, & Ohlott, 1995; Noe & Colquitt, 2002; Rigney, Munro, & Crook, 1979; Snow, 1989; Wexley, 1984). Further, prior literature suggests that these attributes determine the quality of any instructional activity, regardless of whether it is a formal activity or self-development activity (Campbell & Kuncel, 2001; Gagne & Briggs, 1979).

The critical difference between a formal training/development activity and a self-development activity is that the instructional design attributes of formal activities are pre-selected by an external source, such as a trainer (Briggs, 1977). In self-development, the employee is ultimately responsible for determining the levels of these attributes, as he/she selects the self-development activity in which to participate (Confessore, 1992; Ellinger, 2004). There is no guarantee that the employee will make appropriate choices with respect to participation in self-development activities that contain optimal levels of the instructional design attributes. For instance, the employee may select a self-development activity that is too easy to produce development. Alternatively, the employee may choose a self-development activity that has little to do with the job knowledge/skill areas in which he/she is most lacking (i.e., low on content relevancy). In order to maximize the benefits of self-development, an organization must understand the factors that influence the appropriateness of employee self-development choices.

Self-development research suggests that supervisors have the capability to guide and support employee self-development choices by providing job performance feedback (Kozlowski & Hults, 1987; London & Smither, 1999). Further, empirical research demonstrates that performance feedback can positively influence future employee cognitions and work behaviors (Smither & Walker, 2004). To date, no theoretical or empirical research has investigated the influence of supervisory feedback on the quality of employee self-development choices.

Purpose of the Present Research

The purpose of this research is to investigate the influence of supervisory feedback on the quality of employees' self-development choices and behaviors. Different attributes of feedback influence the consequences of a feedback message (Kluger & DeNisi, 1996). Research has consistently acknowledged three content attributes on which feedback may vary: *behavioral focus, development focus,* and *severity*. These attributes impact the degree to which feedback is perceived as credible, motivates a desire for behavioral change, and generates such change (Brett & Atwater, 2001; Nathan, Mohrman, & Milliman, 1991; Smither & Walker, 2004). Accordingly, this research seeks to understand how content attributes of supervisory feedback shape the quality of employee self-development choices.

The introduction is organized as follows. First, the instructional design attributes indicative of a high quality instructional activity are reviewed. Then, the subsequent section presents a path model explicating the mechanisms by which supervisory feedback attributes influence employee self-development activity choices with respect to the instructional design attributes.

Attributes Reflecting High Quality Instruction

Across the instructional design, adult learning and education, and training and development literatures, four primary instructional design attributes have been identified as key determinants of instructional activity quality. The instructional design attributes of content relevancy, learner engagement, challenge, and structure have consistently been acknowledged for their effect on learning, retention, and transfer (e.g., Azevedo & Bernard, 1995; Knowles, 1980; Kraiger, 2003; McCauley et al., 1995; Shute, Gawlick, & Gluck, 1998; Snow & Lohman, 1984; Rigney et al., 1979; Taylor, 1981). Further, these attributes determine the quality of both formal activities and self-development activities (Campbell & Kuncel, 2001; Gagne & Briggs, 1979). An overview of each attribute follows.

Content relevancy is the degree to which the instructional content of an activity directly addresses specific knowledge and skills in need of development. It reflects the alignment between the learner's personal work-related developmental needs or goals and learning objectives of the instructional activity (Garrison, 1997; Knowles, 1980).

A learning environment reflecting high *learner engagement* stimulates learners to be mindfully engaged in the process of practicing, evaluating, and applying the capability to be mastered during instruction (Brown & Ford, 2002). Two interrelated components of learner engagement are practice and progress evaluation information (Garet, Porter, Desimone, Birman, & Yoon, 2001). Practice is the degree to which an activity requires the learner to produce responses, cognitive or physical, using the content of the activity rather than merely watching, listening, or reading the content. Progress evaluation information is the degree to which an activity provides for the obtainment of specific information about one's mastery level and progress with respect to learning efforts (e.g., mastery feedback provided by an instructor or the instructional materials) (Gagne & Briggs, 1979).

Challenge is the degree to which an instructional activity represents a personally demanding situation requiring a considerable amount of cognitive or physical effort in order to develop one's knowledge/skill levels. Activities reflect a higher level of challenge when they demand knowledge/skills beyond the learner's current capabilities, require demonstration of the knowledge/skills being developed, and/or require learners to encounter ideas/tasks that are novel from their own ideas/experiences (Guthrie & King, 2004; Van Velsor & McCauley, 2004).

Finally, *structure* is the degree to which an instructional activity explicitly determines the content to be learned, the learning objectives, pacing, and hierarchical structure and sequencing of the instructional material for the learner (Glaser, 1990; Tennyson & Breuer, 1997). With low-structure activities, learners establish and maintain control over such aspects of the activity.

To understand how an employee's self-development choices with respect to these attributes are influenced by feedback, it is necessary to investigate the particular mechanisms underlying this relationship. This research proposes that employee self-regulatory processes mediate the relationships between supervisory feedback and employee self-development choices.

Influence of Performance Feedback Attributes on Self-Development Quality via Self-Regulation

Self-development is an internally-based, self-motivated activity (Zimmerman, 1998). According to the social cognitive theory, self-regulation plays a central role in self-motivation. Self-regulation is defined as the cognitive processes that enable the transformation of motivational force into behavior and performance (Kanfer, 1990). Self-regulatory processes have been found to influence individuals' decisions involving choice of activities in which to engage (Bandura & Cervone, 1983; 1986). Self-regulation research also demonstrates that the provision of performance feedback can trigger (i.e., can externally motivate), as well as shape an individual's self-regulation (Prussia & Kinicki, 1996; Schunk, 1983). Thus, supervisors should have the capability to motivate and guide employee self-development activity choices by providing feedback which directly influences employee self-regulation.

This section describes a model explicating how the content attributes of supervisory feedback influence the quality of an employee's self-development choices through their effect on the employee's self-regulatory processes (see Figure 1 for the *a priori* model). To investigate the effect of feedback on employee self-development quality, the role of self-regulatory processes on subsequent self-development activity choices must first be understood. Accordingly, this section begins with an overview of relevant self-regulatory processes, followed by the proposed relationships among these self-regulatory processes and employee self-development choices.

Self-Regulatory Processes

Self-regulation operates through an internal comparison process whereby individuals possess goals/standards for a given behavior and remain vigilant for any discrepancies that occur between these goals and their behavior (Bandura, 1978). This comparison process involves a set of interdependent self-regulatory processes that include self-evaluation and self-reactions.

Self-evaluation refers to the comparison of one's behavior/performance with a previously set standard/goal (Kanfer, 1990; Kanfer & Ackerman, 1989). Individuals' self-evaluations can be examined with respect to accuracy (e.g., Atwater & Yammarino, 1997) and magnitude (e.g., Bandura & Cervone, 1983; 1986). Accuracy refers to the degree to which one has a valid understanding of one's current performance or knowledge/skill strengths and weaknesses in relation to the standard. Magnitude refers to the size of the self-perceived discrepancy (positive or negative) between one's overall performance or knowledge/skill levels and the standard.

Self-reactions refer to one's evaluative judgments concerning the identified discrepancy (or lack thereof) between one's performance and the standard; these self-reactions serve to motivate and guide subsequent choices and behavior (Kanfer, 1990). Two types of self-reactions are elicited: self-dissatisfaction/satisfaction and self-efficacy expectations. *Self-dissatisfaction/satisfaction* is the magnitude of positive or negative feelings regarding one's current performance or knowledge/skill levels compared to the standard/goal. Research shows that a negative self-evaluation typically yields dissatisfaction, whereas a positive self-evaluation yields satisfaction (Bandura & Cervone, 1986). *Self-efficacy* is defined as "beliefs in one's capabilities to mobilize the motivation, cognitive resources, and courses of action needed to meet given situational demands" (Wood & Bandura, 1989, p. 408). Because self-efficacy is domain specific (Bandura, 1977), the self-efficacy of relevance to self-development is self-efficacy for self-development - beliefs in one's capability for knowledge/skill development by participating in a self-development activity.

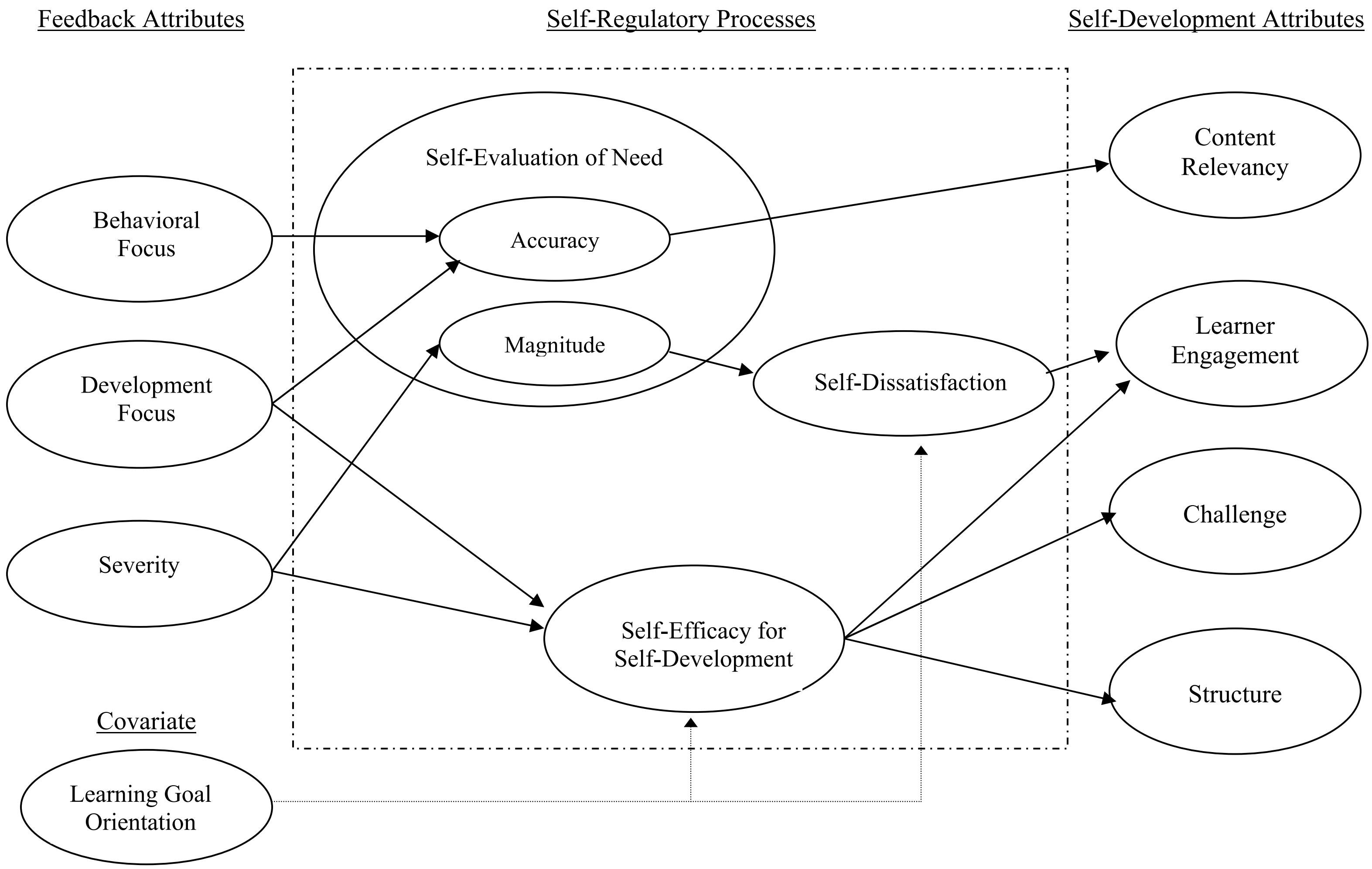
Feedback Attributes
Self-Regulatory Processes
Self-Development Attributes
Self-Evaluation of Need
Behavioral Focus
Accuracy
Content Relevancy
Magnitude
Development Focus
Self-Dissatisfaction
Learner Engagement
Challenge
Severity
Self-Efficacy for Self-Development
Structure
Covariate
Learning Goal Orientation

Figure 1. Hypothesized model of the influence of supervisory performance feedback on employee self-development quality

Influence of Self-Regulatory Processes on Self-Development Activity Quality Choices

Self-evaluation of development need. The *accuracy* of an employee's self-evaluation of a development need is expected to serve as a mediator of the relationship between supervisory feedback and an employee's self-development activity choices with respect to the attribute of content relevancy (see Figure 1). The content of a high quality self-development activity directly addresses the knowledge/skills in need of improvement (Garrison, 1997). Thus, employees lacking accurate knowledge of their performance deficiencies and corresponding knowledge/skill development needs are ill-equipped to select a self-development activity which is content relevant. In contrast, employees who possess accurate self-knowledge are better able to select self-development activities that correspond with their particular development needs. This expectation is consistent with goal setting research which suggests that an identified need/goal guides the selection of activities in which to engage, such that their attention and effort are directed toward goal-relevant activities or actions and away from activities or actions which are irrelevant to the identified goal or need (e.g., Latham & Locke, 1991; Rothkopf & Billington, 1979). It is expected that employees who accurately self-evaluate their specific development needs choose to participate in self-development activities that are higher in content relevancy.

The *magnitude* of an employee's self-evaluation also influences his/her self-development activity choices, albeit indirectly. Self-evaluation magnitude influences self-dissatisfaction levels; which in turn, influences the amount of learner engagement present in the selected activity.

Self-dissatisfaction. Level of self-dissatisfaction is expected to serve as a mediator of the relationship between feedback and self-development activity choices with respect to the attribute of learner engagement (see Figure 1). According to social cognitive theory, goals serve as the reference point for self-satisfaction versus dissatisfaction. When goal-performance discrepancies are positive, individuals are satisfied with their performance, whereas negative goal-performance discrepancies result in self-dissatisfaction (Kanfer & Ackerman, 1989).

Research supportive of social cognitive theory demonstrates that higher self-dissatisfaction enhances an individual's level of effort (see Bandura & Cervone, 1983; 1986; Cervone, Jiwani, & Wood, 1991; Locke, Cartledge, & Knerr, 1970). In short, individuals are motivated to enhance their effortful behavior in order to avoid undesirable outcomes (e.g., the discontent associated with substandard performance) and to attain valued outcomes (e.g., the self-accomplishment derived from reaching or exceeding a goal) (Bandura, 1986). Consistent with this research, it is expected that employees possessing greater dissatisfaction with their knowledge/skill levels will choose to participate in self-development activities reflecting higher learner engagement. Such activities demand a greater degree of learner effort directed toward knowledge/skill development by engaging the learner in extended practice and progress evaluation with respect to their learning.

Self-efficacy for self-development. An employee's level of self-efficacy for self-development is expected to serve as a mediator of the relationships between supervisory feedback and several employee self-development activity choices (see Figure 1). First, self-efficacy for self-development should affect amount of learner engagement. Self-efficacy has been found to influence choice of activities, as well as the amount of time and effort allocated to the selected activities (Bandura, 1977; Jacobs, Prentice-Dunn, & Rogers, 1984). Research also demonstrates that individuals with higher self-efficacy engage in greater amounts of practice (Collins, 1982).

Bandura (1986) proposed that the reason why individuals with high self-efficacy are likely to intensify their level of effort in order to improve their performance is that they perceive a direct relationship between personal effort expended and achievement of a desired performance outcome. Individuals with low self-efficacy doubt their capability to successfully attain the desired performance outcome regardless of the amount of effort expended. Likewise, because individuals with low self-efficacy for self-development are less assured of their capability to positively improve their knowledge/skill levels by participating in self-development activities, they should be less willing to exert persistent effort to achieve this outcome. Accordingly, it is expected that employees possessing low self-efficacy will be less likely to choose activities reflecting higher learner engagement. As aforementioned, such self-development activities require greater learner effort (e.g., engaging in more practice to master the instructional content).

Self-efficacy should also positively influence an employee's self-development choices in terms of the challenge and structure. Self-efficacy influences individuals' activity selection decisions such that they avoid activities perceived as exceeding their capabilities and readily engage in activities for which they feel efficacious (Bandura, 1977; Betz & Hackett, 1983). Research demonstrates that individuals with low self-efficacy may self-select out of activities perceived to be difficult rather than display inferior performance once the activity has begun (Betz & Hackett, 1983). Further, goal setting research suggests that individuals with higher self-efficacy tend to choose more difficult performance goals than those with low self-efficacy (Bandura & Cervone, 1986). Based on this work, it is expected that employees with low self-efficacy for self-development will choose to participate in less challenging self-development activities because of the increased perceived probability of successfully completing such activities.

Employees with low self-efficacy for self-development are also expected to select more highly structured activities. Prior research suggests that individuals with low self-efficacy experience greater anxiety when facing a demanding task or situation (Bandura, 1986; Bandura, Cioffi, Taylor, & Brouillard, 1988). Individuals with low self-efficacy also have a tendency to avoid demanding tasks or situations whenever possible, as they are perceived as threatening (Bandura, 1977). A highly structured self-development activity represents a less demanding learning environment for learners because learning activities with high structure impose an explicit direction for learning (Snow, 1989). For instance, such activities provide guidance and scaffolding in the form of explicit, sequential learning strategies for the learner to employ throughout the activity (Snow & Lohman, 1984). This externally-provided structure reduces anxiety and self-doubt in regard to one's capability to successfully learn the content of the activity. In contrast, low-structure learning activities require individuals to completely create their own direction for development (Snow, 1989); for instance, learners must make decisions with respect to the scope of the activity's content, including the type, sequence, and number of instructional components. Such activities may be perceived as more threatening because success or failure of the activity rests solely on the learner. Accordingly, it is expected that employees with lower self-efficacy for self-development will choose to participate in self-development activities higher in structure.

Influence of Supervisory Feedback Attributes on Employee Self-Regulation and Self-Development

This section addresses the influence of the supervisory feedback attributes on employee self-development choices through the direct influence of feedback on employee self-regulatory processes. Specifically, relationships among the feedback attributes and employee self-regulatory processes are described, and a set of mediational hypotheses are offered specifying the effects of feedback attributes on employee self-development choices via self-regulatory processes.

Behavioral focus of feedback. Behavioral focus is the degree to which the content of a feedback message reflects observable job behaviors or tasks that the employee exhibited (or failed to exhibit) while performing the job (Baron, 1988; Smither & Walker, 2004). A feedback message high in behavioral focus provides descriptive information concerning the employee's past performance, such as concrete examples of behaviors the employee performed ineffectively or failed to perform which resulted in a substandard level of performance. Behavioral focus is expected to influence an employee's self-development quality choices through its direct effect on the accuracy of the employee's self-evaluation of a development need (see Figure 1).

Research suggests that employees' initial self-evaluations reflect a tendency to overestimate positive capabilities while minimizing weaknesses (Harris & Schaubroeck, 1998; Martin & Klimoski, 1990). Thus, employees may not perceive a need for knowledge/skill development even though such a need exists (Atwater & Yammarino, 1997). The provision of feedback with a high behavioral focus is expected to positively alter the accuracy of an employee's self-evaluation because it provides an understanding of one's specific job behaviors in need of improvement; which in turn, aids an employee in accurately identifying his/her underlying knowledge/skill deficiencies. In contrast, a feedback message low in behavioral focus includes relatively little information that is stated in objective behavioral terms; instead, the content may be stated in more subjective, emotional terms. Employees tend to perceive such feedback as less credible (Jacobs, Jacobs, Feldman, & Cavior, 1973); and, consequently, they may be less likely to alter their initial self-evaluations to reflect their performance deficiencies. Moreover, such feedback provides less direction with respect to one's knowledge/skills requiring development.

Prior performance appraisal research is supportive of these assertions. Specifically, research has found that employees receiving feedback reflecting a higher behavioral focus experienced greater clarity with respect to job performance standards and their particular areas in need of improvement (Hanson, Morton, & Rothaus, 1963; Nathan et al., 1991). Given the above, as well as the previously proposed relationship between self-evaluation accuracy and employee self-development choices with respect to content relevancy (see prior section), it is hypothesized that:

> *Hypothesis 1:* The positive relationship between the behavioral focus of supervisory feedback and the content relevancy of an employee's chosen self-development activity is mediated by the employee's self-evaluation accuracy.

Development focus of feedback. Development focus is the degree to which the content of a feedback message provides specific suggestions for future development goals, as well as recommendations of development strategies or activities in which one could engage to improve current knowledge or skill levels (e.g., Burke, Weitzel, & Weir, 1978). Development focus is expected to influence an employee's self-development quality choices through its effects on the accuracy of the employee's self-evaluation of a development need and self-efficacy for self-development (see Figure 1).

First, consider the influence of this feedback attribute on the accuracy of employees' self-evaluations with respect to personal development needs. Prior performance appraisal research suggests that development-focused feedback may facilitate a realistic self-evaluation, in that the provision of specific goals and action plans for development serves to direct an employee's attention to the particular areas of performance in need of improvement (Meyer, Kay, & French, 1965; Nathan et al., 1991). For instance, Nathan et al. (1991) demonstrated that employees who received a greater degree of development-focused feedback reported a better understanding of performance areas requiring improvement and also demonstrated greater performance improvements. Given the above, as well as the aforementioned influence of self-evaluation accuracy on the content relevancy of selected self-development activities, it is hypothesized that:

> *Hypothesis 2a:* The positive relationship between the development focus of supervisory feedback and the content relevancy of an employee's chosen self-development activity is mediated by the employee's self-evaluation accuracy.

Provision of development-focused performance feedback is also expected to enhance an employee's self-efficacy for self-development. Performance appraisal research suggests that when supervisors help employees identify possible goals to overcome performance deficiencies, employees possess higher self-efficacy for performance improvement (Taylor, Fisher, & Ilgen, 1984). Accordingly, high development-focused feedback is expected to enhance an employee's self-efficacy for self-development because it provides the employee with a recommendation of specific goals for knowledge/skill development.

Further, the provision of effective strategies or resources for overcoming obstacles to attaining a standard has also been found to increase self-efficacy (Frayne & Latham, 1987), as self-efficacy is determined in part by the assessment of the adequacy of one's performance strategies for successful task/goal accomplishment (Gist & Mitchell, 1992). Accordingly, development-focused feedback is expected to enhance an employee's self-efficacy for self-development because it supplies recommendations of viable development strategies/activities that the employee can implement to effectively improve his/her knowledge/skills. Given this, as well as the previously proposed relationships between self-efficacy for self-development and the self-development choices of learner engagement, challenge and structure, it is hypothesized that:

> *Hypothesis 2b-d*: Self-efficacy for self-development mediates the relationships between the development focus of supervisory feedback and the quality attributes of learner engagement, challenge, and structure.

Severity of feedback. Severity is the degree to which a feedback message is negative in sign. Feedback which is high in severity focuses almost entirely on an employee's weaknesses identifying several different deficiencies with respect to job knowledge/skills while identifying few strengths. The severity of feedback is expected to influence an employee's self-development activity quality choices through its direct effect on the magnitude of the employee's self-evaluation of a development need (and indirect effect on self-dissatisfaction) (see Figure 1). Severity is also expected to influence an employee's self-development activity choices through its direct effect on the employee's self-efficacy for self-development.

First, consider the influence of severity on the magnitude of an employee's self-evaluation of a development need. As discussed previously, employees have a tendency to overestimate their positive capabilities while minimizing performance weaknesses (e.g., Meyer et al., 1965; Thornton, 1968). As such, employees tend to possess less negative self-evaluations, reflecting fewer performance deficiencies or development needs, as compared to evaluations provided by their supervisors (Harris & Schaubroeck, 1998). However, according to the symbolic interactionist perspective (Cooley, 1902; Mead, 1934), self-perceptions may be shaped from others' evaluations. This perspective implies that self/other evaluation discrepancies are typically dealt with by changing one's self-perceptions to better align with the 'other' evaluation (Shrauger & Schoeneman, 1979). Indeed, feedback research demonstrates that the provision of negative feedback drives an individual to alter his/her self-evaluations to better match the feedback provided (Atwater, Roush, & Fischthal, 1995; Reilly, Smither, & Vasilopoulos, 1996).

Consistent with this research, it is expected that the degree of severity of the supervisory feedback should positively influence the magnitude of one's subsequent self-evaluation of a development need (i.e., the amount of personal knowledge/skill development needs identified). Given the above, as well as the previously proposed relationships between self-evaluation magnitude, self-dissatisfaction, and employee self-development activity choices with respect to the attribute of learner engagement, it is hypothesized that:

> *Hypothesis 3a:* The positive relationship between the severity of supervisory feedback and the quality attribute of learner engagement is mediated by self-evaluation magnitude and self-dissatisfaction.

The severity of feedback is also expected to influence an employee's self-efficacy for self-development. Performance appraisal research suggests that there is a tolerance level for the amount of criticism an individual can handle at any one point in time (Meyer et al., 1965). As such, highly severe feedback, reflecting primarily deficiencies with respect to one's job behaviors, knowledge and skills, is believed to greatly reduce an individual's self-assessment of his/her personal abilities (Kluger & DeNisi, 1996). Indeed, research suggests that individuals receiving information indicating that their performance falls markedly below established standards are apt to doubt their ability to create significant improvements in their performance and consequently abandon their performance goals (Milkulincer, 1988; 1989). Based on this prior research, it is expected that employees who receive performance feedback reflecting primarily performance deficiencies will doubt their personal capability to eliminate these deficiencies regardless of the particular improvement approach employed, and in particular, by utilizing solely self-development efforts (as self-development places sole responsibility for successful performance improvement on the employee). Given this assertion, as well as the previously proposed relationships between an employee's self-efficacy for self-development and his/her self-development activity choices, it is hypothesized that:

> *Hypothesis 3b-d:* Self-efficacy for self-development mediates the relationships between the severity of supervisory feedback and the quality attributes of learner engagement, challenge, and structure.

METHOD

Participants and Procedure

Participants in this research included 149 full-time employees recruited from a large-size fire department. This sample was particularly appropriate because a large percentage of the employees are engaged in self-development in some capacity. Firefighters and Paramedics, as an occupational group, must maintain various job knowledge and skills necessary to effectively perform critical job tasks, such as search and rescue or advanced life support. In the current sample, 86% of the participants reported completing one or more self-development activities within the past 5-12 months.

Eighty five percent of the participants were male and the mean age was 39.70 (SD = 8.25). All employees had worked for this fire department for at least one year and the mean organizational tenure was 13.62 years (SD = 8.93). Seventy-five percent (N = 111) held an entry-level, non-supervisory position and 25.5% (N = 38) held a low to mid-level leadership position in the organization. The ethnic composition of the sample was 77% Caucasian, 19% African American, 3% Hispanic, and 2% Asian.

Data for this research were gathered from three sources: the employee participant, his/her supervisor, and the employee's annual performance feedback report. First, a memorandum, introducing the research was distributed to all employees who held a non-supervisory to mid-level leadership position (N = 187). Interested employees later completed a questionnaire during their regular work hours which assessed their self-regulatory processes and the self-development activities in which they engaged since receiving their most recent performance feedback report. Next, an evaluation of the participant's specific job knowledge/skills in need of development was completed by his/her supervisor. Finally, data were gathered from the participant's most recent annual performance feedback report (obtained from his/her personnel file). Note that the length of time separating an employee's receipt of the feedback report and completion of the questionnaire was at a minimum 5 months (maximum = 12 months) to ensure there was adequate time for self-development.

Performance Feedback Content Attribute Measures

Prior performance feedback research suggests that feedback recipients devote considerable attention to the written comments provided on performance feedback reports (Antonioni, 1996; Smither & Walker, 2004). This may be due in part to the feedback recipients' perception of qualitative feedback as more useful than quantitative feedback in determining particular areas in need of improvement (Rose & Farrell, 2002). Accordingly, the current research focused on information obtained from the written statements provided on the employee performance feedback report.

Coding procedure. Consistent with content analysis methods suggested in previous research (Macey, 1996; Smither & Walker, 2004), the qualitative feedback statements were first divided into single-theme comments. Each single-theme feedback comment was coded by two separate individuals. Coders were familiarized with the three feedback content attributes and the type of language that might reflect them within a single-theme comment. Each attribute was coded on a 5-point scale using a detailed coding scheme. Severity was coded on a scale ranging from *entirely favorable* to *entirely unfavorable*. The scale for behavioral focus ranged from *very low behavioral focus* to *very high behavioral focus* and the scale for development focus ranged from *very low development focus* to *very high development focus*. For each participant, an average attribute rating across the comments (e.g., average rating for severity across comments) was calculated for each coder. The final attribute rating utilized represented the mean of the two coders' average attribute ratings. When the coders' average attribute ratings were farther apart that .50, coders reviewed the single-theme comments and reached consensus concerning the appropriate rating to provide. Interrater agreement, calculated as the intraclass correlation - $ICC_{(2,1)}$ (Shrout & Fleiss, 1979), was computed for each feedback attribute based on the pre-consensus ratings. Interrater agreement was .85 for severity, .81 for behavioral focus, and .83 for development focus.

Self-Regulatory Process Measures

Self-evaluation of development need. Magnitude of an employee's self-evaluation of a development need was measured using a scale modified from Ford and Noe's (1987) training needs scale. Ford and Noe measured self-assessed training needs by asking participants to respond to the following question for several different skills: "To what extent do you have a training need in this area?" Possible responses ranged from 1 (to no extent) to 5 (to a very large extent). Likewise, in this research, participants were asked to indicate the extent to which they had a development need in several knowledge/skill areas. The areas assessed represented the complete set of knowledge/skills deemed necessary for effective performance as indicated on the organization's standardized performance feedback instrument (for example, communication, safety). Overall magnitude of self-evaluation of development need was measured as the mean development need rating across the entire set of knowledge/skill areas. The coefficient alpha was .87.

Accuracy of self-evaluation of development need was operationalized as the degree to which an employee's self-evaluation of his/her development needs is in agreement with the evaluation provided by the direct supervisor. This operationalization is consistent with prior research (e.g., Roush & Atwater, 1992; Van Velsor, Taylor, & Leslie, 1993). Accordingly, the employee's supervisor was also asked to evaluate the extent to which the employee possessed a development need in regard to each knowledge/skill area evaluated on the employee performance feedback report. Self-evaluation accuracy was measured as the percent agreement between the employee's and supervisor's evaluation.

Self-dissatisfaction. Self-dissatisfaction was assessed with two items modified from Prussia and Kinicki's (1996) affective evaluation scale. Items were modified to reflect dissatisfaction with future job knowledge/skill levels in a performance appraisal context. An example item is "How dissatisfied/satisfied would you be if you were to make no gains in your job knowledge or skills by your next performance evaluation?" Possible responses ranged from 1 (very dissatisfied) to 5 (very satisfied). Responses were reverse scored to indicate level of dissatisfaction. All items of this scale are provided in the Appendix. The coefficient alpha was .89.

Self-efficacy for self-development. Self-efficacy for self-development was measured using a 3-item scale modified from Maurer, Weiss, and Barbeite's (2003) self-efficacy for development scale. Items were modified to reflect self-development activities. An example item is "I can increase my job knowledge or skills beyond their current levels by performing self-development activities." Possible responses ranged from 1 (strongly disagree) to 5 (strongly agree). All items of this scale are provided in the Appendix. The coefficient alpha was .90.

Self-Development Activity Quality Attribute Measures

Measurement approach. Participants were asked to list all of the self-development activities completed since receiving their most recent performance feedback report. Participants were then asked to describe the activity which was most relevant to the knowledge/skills used in their current job. This free-response measure, adapted from Tough's (1971) self-development interview protocol, was developed in order to elicit detailed, factual information indicative of the degree to which the four instructional design attributes were present in the activity completed.

Coding procedure. Consistent with the content analysis methods utilized for the feedback attributes, each employee's free-response self-development activity description was independently coded by two individuals. Coders were thoroughly trained to make judgments concerning the instructional attributes using a detailed coding scheme. Content relevancy was rated using a 5-point scale ranging from *not at all* to *a very great extent*. Coders rated the extent to which the described activity directly targeted each of the knowledge/skill areas identified as in need of development by the employee's supervisor; the final content relevancy score was calculated as the mean content relevancy rating across this identified set of knowledge/skill areas. The other attributes were rated similarly using a 5-point scale ranging from *very little* to *very large amount*. After independently coding each self-development activity according to the four attributes, coders discussed and reached consensus anywhere disagreement initially occurred. Interrater agreement, calculated as $ICC_{(2,1)}$ (Shrout & Fleiss, 1979), was computed for each attribute based on the pre-consensus ratings. Interrater agreement was .86 for content relevancy, .88 for learner engagement, .85 for challenge, and .89 for structure.

Individual Difference Covariate – Learning Goal Orientation

The education and training literature has repeatedly demonstrated the importance of the individual difference of learning goal orientation (LGO) in instructional and development contexts. LGO reflects one's stable desire to continually increase task competence and one's beliefs about the improvability of knowledge/skills (Vandewalle, 1997). LGO has been found to influence learners' motivation to learn, self-regulatory processes, and level of learning (Colquitt & Simmering, 1998; Fisher & Ford, 1998), as well as self-development participation (Birdi et al., 1997; Boyce, 2004). Accordingly, LGO was included as a covariate in the *a priori* model in order to evaluate if performance feedback contributes to the quality of employee self-development choices beyond this noteworthy individual difference (see Figure 1 for its suggested role). This construct was assessed using Vandewalle's (1997) 5-item LGO scale. A sample item is "I often look for opportunities to develop new skills and knowledge." Possible responses ranged from 1 (strongly disagree) to 5 (strongly agree). All items of this scale are provided in the Appendix. The coefficient alpha was .89.

Analytic Strategy

The hypothesized model was tested using LISREL 8.5 (Jöreskog & Sörbom, 1993). The two items of the self-dissatisfaction scale and three items of the self-efficacy for self-development scale were used as indicator variables. Similar to Williams and Anderson (1994), two indicator variables were created for the latent variables – self-evaluation magnitude and learning goal orientation - by randomly combining their respective scale items. Further, following prior research's guidelines for single item measures (Anderson & Gerbing, 1988; Hayduk, 1987), the reliabilities and variances of single indicator variables (i.e., feedback attributes, self-development activity attributes) were used to fix their respected factor loadings and error variances. Specifically, the path from each of these latent variables to its single indicator was set equal to the square root of the observed variable's reliability and the respective error variance was set equal to the variable's variance multiplied by one minus its reliability coefficient.

Consistent with Anderson and Gerbing (1988), the fit of the measurement model was tested first, followed by the fit of the structural models. In evaluating the adequacy of a given model, this research used: the chi-square goodness-of-fit statistic (χ^2), the root-mean-square error of approximation (RMSEA), the non-normed fit index (NNFI), the comparative fit index (CFI), and the goodness of fit index (GFI). Satisfactory model fit is indicted when the RMSEA value is less than .08, and NNFI, CFI, and GFI values are greater than .90 (Hoyle, 1995; Schumacker & Lomax, 1996; Vandenberg & Lance, 2000). Additionally, a nested approach was employed to test an alternative theory-based model. Specifically, fit of the *a priori* model was compared against a less constrained, partially-mediated multiplicative model.

RESULTS

Descriptive Statistics

Correlations, means and standard deviations of the research variables are displayed in Table 1.

Model Assessment

Measurement model. Prior to assessing the *a priori* model, the measurement model was assessed. The measurement model fit the data very well (RMSEA = .029; NNFI = .98; CFI = .99; GFI = .94). In addition, all path coefficients were significant ($z > 1.96$).

A priori structural model. The *a priori* structural model tested whether the relationships between the feedback attributes and self-development quality attributes are fully-mediated by self-regulatory processes. Analysis of this model indicated that the data fit the model moderately well (RMSEA = .071; NNFI = .89; CFI = .91; GFI = .86) and represented a significant improvement over the independence model ($\Delta\chi^2$ (91) = 912.05, $p < .01$).

Further, many of the hypothesized paths were statistically significant. In regard to the predictor-mediator relationships, severity significantly influenced self-efficacy for self-development ($\gamma = -.21$, $p < .05$) and approached significance for self-evaluation magnitude ($\gamma = .19$, $p < .10$). With regard to the mediator-outcome relationships, self-evaluation accuracy influenced content relevancy ($\gamma = .23$, $p < .01$). Self-evaluation magnitude had a positive effect on self-dissatisfaction levels ($\gamma = .22$, $p < .01$), which in turn significantly influenced level of

Table 1

Means, Standard Deviations, and Correlations for Research Variables

Measure	N	M	SD	1	2	3	4	5	6	7	8	9	10	11
1. Development Focus	149	1.76	1.26	--										
2. Behavioral Focus	149	3.16	.66	-.08	--									
3. Severity	149	2.31	.45	.22**	.18*	--								
4. Learning Goal Orientation	149	4.19	.62	.03	.12	-.06	--							
5. Self-Evaluation Accuracy	140	78.36	19.28	-.12	-.04	-.37**	.06	--						
6. Self-Evaluation Magnitude	143	1.69	.50	.09	-.12	.18*	-.10	.21*	--					
7. Self-Dissatisfaction	148	4.04	.90	.04	.02	.14^{+}	.41**	-.02	.17*	--				
8. Self-Efficacy for Self-Development	149	4.30	.58	.01	.01	-.17*	.35**	-.01	.09	.22**	--			
9. Content Relevancy	123	2.26	.71	.18^{+}	-.04	-.12	-.03	.21*	.13	.03	.06	--		
10. Learner Engagement	123	3.24	1.34	.17^{+}	-.09	-.04	.05	.07	.11	.18*	.20*	.19^{+}	--	
11. Challenge	123	3.14	1.13	.27**	-.04	.05	.15	.05	.08	.10	.20*	.30**	.78**	--
12. Structure	123	3.60	1.30	.18*	-.02	.10	.08	-.07	-.04	.14	.05	.17^{+}	.23*	.39**

Note. All variables were measured on a 1-5 scale except self-evaluation accuracy (measured as percent agreement).
$^{+}$ $p < .10$. * $p < .05$. ** $p < .01$ (two-tailed).

learner engagement ($\gamma = .16$, $p < .01$). Further, self-efficacy was found to significantly influence learner engagement and challenge ($\gamma = .22$, $p < .05$ and $\gamma = .23$, $p < .05$). Nonsignificant relationships were observed for the relationships between the feedback attributes of behavioral focus and development focus and self-evaluation accuracy ($\gamma = -.07$, *ns* and $\gamma = -.16$, *ns*). Development focus also did not significantly predict self-efficacy ($\gamma = .07$, *ns*), and self-efficacy failed to predict structure ($\gamma = .06$, *ns*). Note, these model parameters are depicted in Figure 2. Although this model fit reasonably well, analyses revealed that the data were considerably more supportive of an alternative model containing more complex relationships between the exogenous and endogenous variables.

Alternative structural model. While the most prominent feedback models depict the influence of feedback on behavioral responses as mediated by cognitive processes of the recipient (e.g., Ilgen, Fisher, & Taylor, 1979; Kluger & DeNisi, 1996; Taylor et al., 1984), some research also examines direct relationships between feedback and the recipient's behavioral responses to the feedback (e.g., Burke et al., 1978; Burke & Wilcox, 1969). Further, although some research reflects the assumption that the attributes of feedback combine additively to influence cognitions and behaviors (e.g., Atwater & Yammarino, 1997; Brett & Atwater, 2001; Fedor, 1991; Ilgen et al., 1979), other research suggests that feedback attributes combine multiplicatively (i.e., interact) to influence subsequent cognitions and behaviors (e.g., Larson, 1984; Kinicki, Prussia, Wu, & McKee-Ryan, 2004; Smither & Walker, 2004). Thus, while there was reason to hypothesize that the influence of performance feedback attributes on self-development choices be represented by a fully-mediated additive model, there is also support for a partially-mediated multiplicative model.

Regarding partial mediation, the feedback attribute of development focus may also influence an employee's self-development choices directly. As stated before, the unique feature of self-development is that an employee is responsible for choosing the direction for his/her own development; thus, the employee must develop a specific plan of action regarding the particular self-development activities to pursue. Development-focused feedback may have a direct influence on an employee's development action plan because it provides specific options of self-development activities to pursue. Further, supervisors are likely to be more knowledgeable than their subordinates on the breadth and quality of available self-development resources (e.g., internal training courses offered, upcoming special project or task assignments). Accordingly, employees may simply choose to follow their supervisor's guidance and embrace the recommended activities as their development plan, without much detailed consideration given to other alternatives. Thus, the attribute of development focus may influence the four self-development choice variables independent of its influence on self-regulation.

Unlike development focus, the attributes of behavioral focus and severity should not influence an employee's self-development activity choices directly. While these attributes provide information concerning aspects of the job that the employee performed well/poorly in the past, they do not supply an *explicit* plan of action for future development. Thus, while these attributes bring self-awareness of one's deficiencies, they do not supply an explicit means for how the deficiencies should be fixed (i.e., what particular self-development activities to pursue). As such, these attributes should influence self-development only through their influence on self-regulation.

Regarding multiplicativity, there is some support in the literature for the notion that behavioral focus and development focus each combine multiplicatively with the attribute of

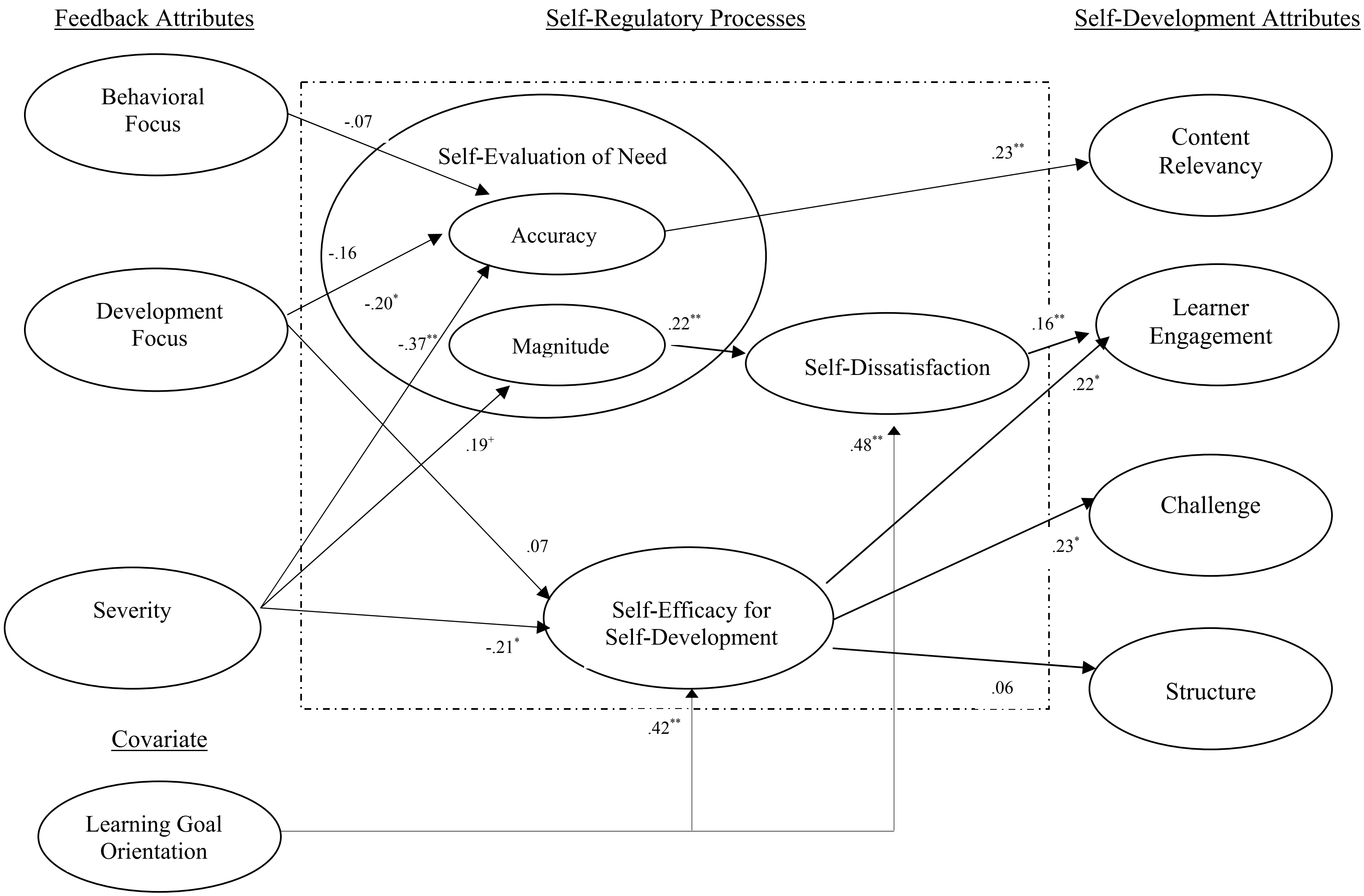
Feedback Attributes
Self-Regulatory Processes
Self-Development Attributes
Behavioral Focus
Development Focus
Severity
Covariate
Learning Goal Orientation
Self-Evaluation of Need
Accuracy
Magnitude
Self-Dissatisfaction
Self-Efficacy for Self-Development
Content Relevancy
Learner Engagement
Challenge
Structure
-.07
-.16
-.20*
-.37**
.19+
.07
-.21*
.22**
.23**
.16**
.22*
.23*
.06
.48**
.42**

Figure 2. Hypothesized model – Standardized path coefficient. $^{+}p < .10$. $^{*}p < .05$. $^{**}p < .01$.

severity. For instance, Smither and Walker (2004) found that severity moderated the relationship between behavioral focus and future job performance, such that high severity stifled the positive impact of behavioral-focused feedback on performance improvement. The literature suggests that the severity/sign of feedback may be the most salient determinant of an individual's future cognitions and behaviors. Further, feedback severity is recognized to be a complex stimulus in that it produces several kinds of responses. Kluger and DeNisi (1996) suggested four responses to receipt of negative feedback: 1) change one's behavior, 2) change the performance standard, 3) reject the feedback, or 4) abandon the standard. Feedback higher in severity frequently results in the latter two responses (Brett & Atwater, 2001; Milkulincer, 1988). These negative responses may be due to the "overload phenomenon," whereby the feedback provided exceeds the tolerance level for the amount of criticism one can accept at a given time (Meyer et al., 1965).

One way that feedback recipients handle a high degree of criticism is to enact self-protection mechanisms when interpreting the feedback. Recipients of negative feedback may perceive the feedback as inaccurate and in turn reject it (Brett & Atwater, 2001; Kluger & DeNisi, 1996); as such, the feedback receives little weight in self-evaluation (Taylor et al., 1984). Given this finding, the value of behavioral focus or development focus may fail to materialize when coupled with feedback higher in severity because employees discount the entire feedback message in order to preserve their self-concept. In other words, severity may moderate the previously hypothesized relationships between these feedback attributes and self-evaluation accuracy such that the beneficial effect of these attributes decreases as severity increases.

In addition to directional value of feedback, feedback also serves a motivational function to prompt behavioral change (Ilgen et al., 1979). According to expectancy theory, the motivational force underlying behavioral change is directly proportional to the strength of one's belief that increased effort expended toward a standard will result in its attainment. If expectancy beliefs decrease beyond a certain point, the likely response is abandonment of the standard (Janoff-Bulman & Brickman, 1982). Research demonstrates that this is a common outcome of severe feedback (e.g., Kluger & DeNisi, 1996; Mikulincer, 1988). Given the influence of severity on employee expectancy beliefs, it is plausible that degree of severity may affect the relationship between development focus and self-efficacy for self-development beliefs (expectancy beliefs |with respect to self-development effort); it may be that the previously hypothesized effect of development focus on self-efficacy becomes negligible as severity increases, as it may be unable to offset the overriding impact of severity on one's self-concept.

Analysis of this alternative model indicated that the data fit the model very well (RMSEA = .050; NNFI = .92; CFI = .94; GFI = .88). This model resulted in a significant improvement in fit compared to the *a priori* model ($\Delta\chi^2$ (8) = 51.59, $p < .01$), suggesting support for partial mediation over full mediation, and multiplicative as well as additive effects. Model parameters are depicted in Figure 3. The path coefficients for the paths specified from development focus to the four self-development attributes were significant ($z > 1.96$). Although the path coefficients for the three interactions were also significant, only two were in the hypothesized direction. Severity moderated the relationships between the attributes of behavioral focus and development focus and self-evaluation accuracy such that the positive effect of these attributes increased as severity decreased (see Figures 4 and 5). Severity also significantly moderated the relationship between development focus and self-efficacy; however, the effect was not in the hypothesized direction.

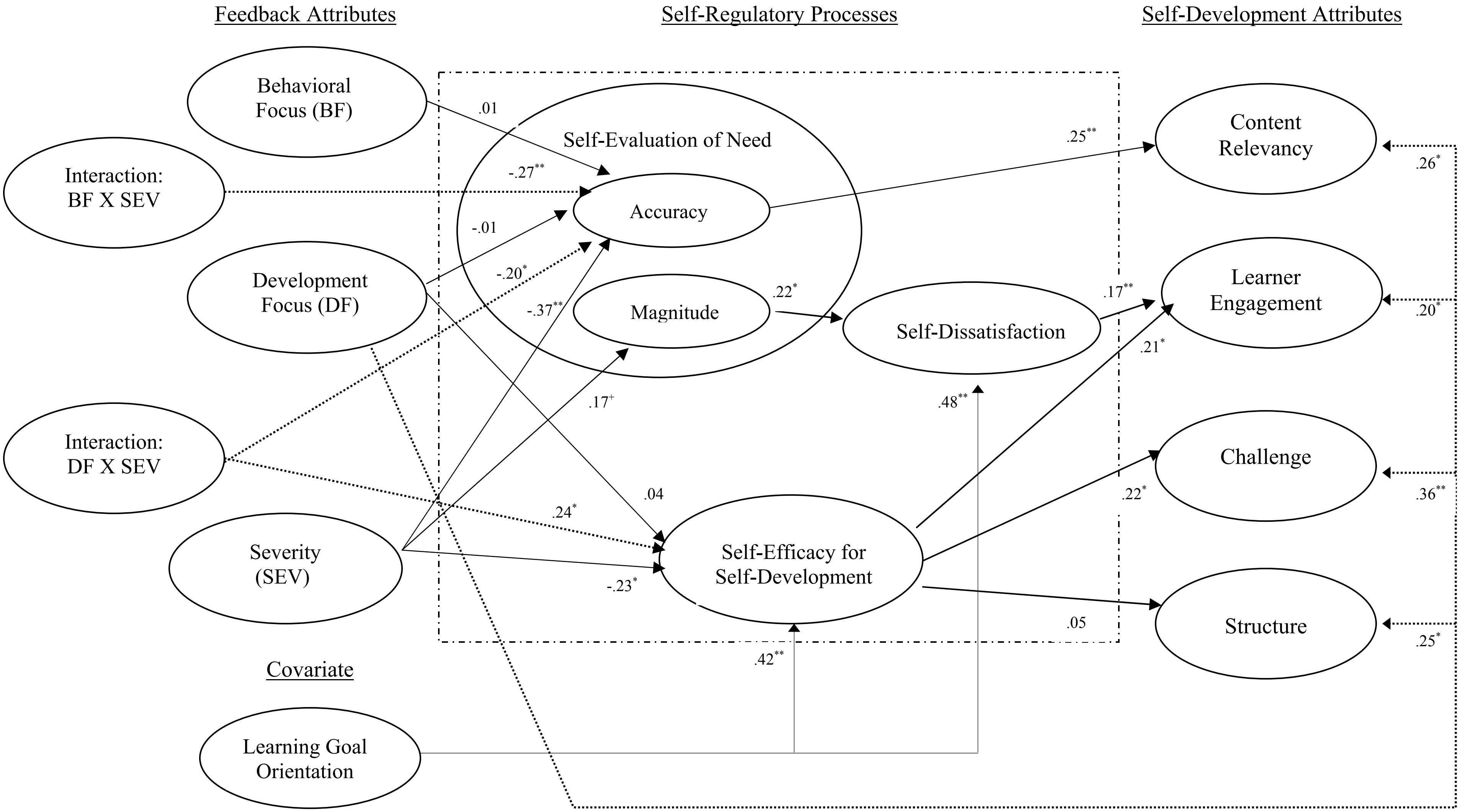
Feedback Attributes
Self-Regulatory Processes
Self-Development Attributes
Behavioral Focus (BF)
Interaction: BF X SEV
Development Focus (DF)
Interaction: DF X SEV
Severity (SEV)
Covariate
Learning Goal Orientation
Self-Evaluation of Need
Accuracy
Magnitude
Self-Dissatisfaction
Self-Efficacy for Self-Development
Content Relevancy
Learner Engagement
Challenge
Structure
.01
-.27**
-.01
-.20*
-.37**
.17+
.22*
.25**
.17**
.21*
.48**
.04
.24*
-.23*
.22*
.05
.42**
.26*
.20*
.36**
.25*

Figure 3. Final model of the influence of supervisory feedback on self-development quality – Standardized path coefficient.

$^{+}p < .10.$ $^{*}p < .05.$ $^{**}p < .01.$

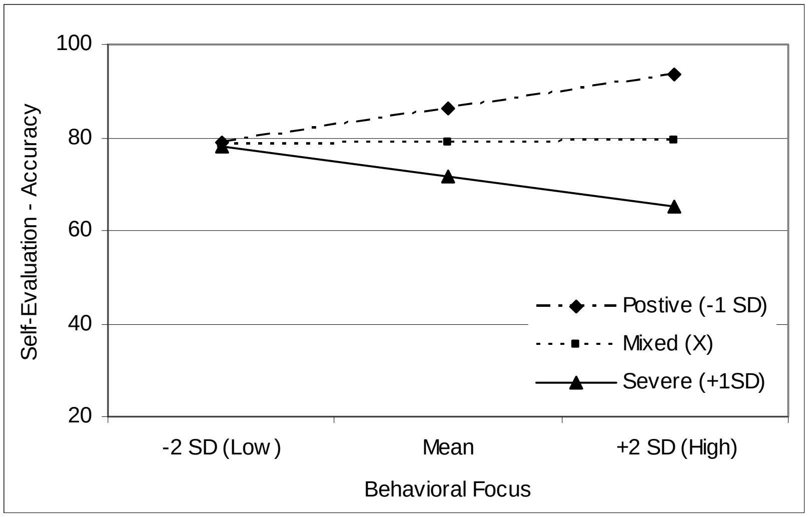

Figure 4. Behavioral focus and severity interaction for self-evaluation accuracy

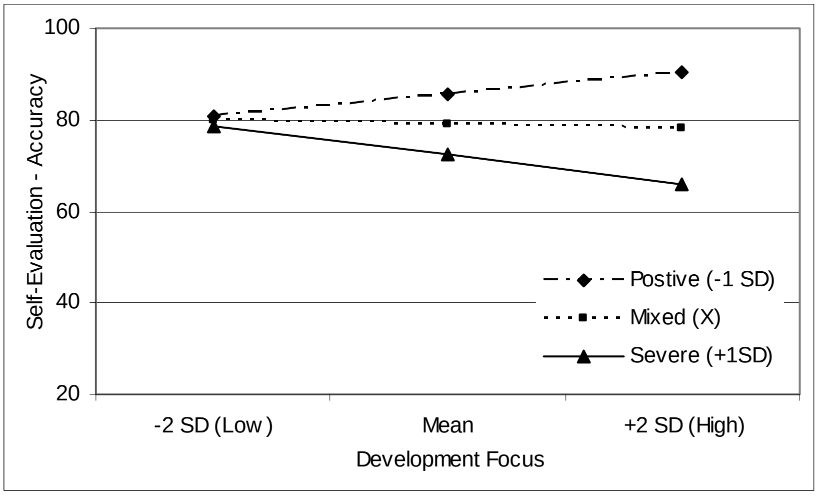

Figure 5. Development focus and severity interaction for self-evaluation accuracy

DISCUSSION

While the importance of self-development quality has been acknowledged in prior theoretical work (e.g., Brookfield, 1984; 1985), to the authors' knowledge, no research has empirically examined the quality of employee self-development efforts or any of its antecedents. The purpose of the present research was to address this gap in the literature.

This research contributes to the existing self-development literature in three ways. First, this research demonstrates that there is considerable variability in the quality of employees' choices and behaviors with respect to self-development. This suggests that it is insufficient to focus only on quantity of self-development. Second, this research demonstrates that variability in quality across employees is explained, in part, by the attributes of supervisory feedback received. Specifically, this research provides a theoretically and empirically supported model explicating the mechanisms by which the attributes of supervisory feedback influence employees' subsequent self-development choices/behaviors. Results suggest that the mechanisms by which these attributes influence employee self-development choices are more complex than originally suspected.

Specifically, the hypothesized positive effect of behavioral focus on content relevancy, via its influence on employee self-evaluation accuracy, decreased as severity increased. The same is true with regard to the hypothesized positive influence of development focus on content relevancy through self-evaluation accuracy. Development focus was also found to have a *direct* influence on content relevancy and the other self-development attributes; employees who received feedback higher in development focus participated in self-development activities higher in content relevancy, learner engagement, challenge, and structure.

Finally with respect to the hypothesized additive effects of severity, as predicted, this feedback attribute demonstrated both a positive and negative effect on the quality of self-development choices. Employees who received feedback reflecting higher severity possessed more negative self-evaluations concerning their development needs. In turn, these employees possessed greater self-dissatisfaction and consequently chose to participate in self-development activities higher in learner engagement (i.e., a positive effect on self-development activity quality). In contrast, more severe feedback had a detrimental effect on employee self-efficacy; and thus, employees chose to participate in activities that were lower in not only learner engagement, but also challenge. In summary, a low to moderate amount of severity may be optimal for facilitating higher quality self-development, as severity primarily had a negative impact on employee self-development choices.

The third contribution of this research is that performance appraisal feedback was found to significantly contribute to the quality of self-development choices even after accounting for the effects of LGO. This finding is of value because LGO has repeatedly been found to be a key determinant of individuals' learning-related cognitions/behaviors (e.g., Boyce, 2004; Schmidt & Ford, 2003).

Limitations and Future Research Directions

The present research has potential limitations that should be noted. First, the quality of an employee's self-development efforts was assessed with respect to the most relevant self-development activity in which the employee engaged. However, some employee participants completed multiple self-development activities. Ideally, the quality of an employee's self-development would be assessed for the entire set of activities completed. Practically, requiring a participant to provide a detailed description of all self-development activities completed would have been quite cumbersome. It was expected that such a requirement would have significantly reduced the overall participation rate, as well as the quality of the responses provided.

Second, the present research was unable to examine if engagement in higher quality self-development resulted in improvement in one's future job performance or knowledge/skill levels. Although an extensive amount of research on formal training and development has found that the attributes of content relevancy, learner engagement, challenge, and structure are positively related to learning and performance (e.g., Kraiger, 2003; Noe & Colquitt, 2002), future research should empirically verify whether self-development quality (identified based on these four attributes) positively corresponds with improvements in performance or knowledge/skills.

Concerning directions for future research, while this research focused on supervisory feedback provided in an employee's annual performance feedback report, it is likely that supervisory feedback provided more informally may also play an influential role on employee self-regulatory processes and self-development choices. Indeed, prior work supports the value of informal feedback on employee's work-related cognitions and behaviors (Farr, 1993; Larson, 1984). In addition, it would also be useful to examine the effect of other feedback attributes beyond feedback *content* attributes, such as feedback source or credibility. For example, research should examine whether feedback provided by other organizational members, such as more experienced coworkers or even subordinates via a multi-rater assessment system (e.g., the U.S. Army's 360-degree *Army Leader Assessment and Feedback Program (ALAFP)* or *Leader AZIMUTH Check*, see Karrasch, 2006; Karrasch & Halpin, 1999; Rovero & Bullis, 1998), impact the quality of an employee's self-development choices.

Future research should also investigate other promising antecedents (beyond feedback) of self-development quality, such as such as level of organizational support for self-development or other employee individual differences beyond learning goal orientation. Finally, it would be useful to examine whether particular antecedents are more (or less) influential on self-development decisions with respect to quality versus quantity; and further, whether the mechanisms by which given antecedents operate differ for quality- versus quantity-focused self-development decisions.

Implications for the U.S. Army

Leader development in the U.S. Army is accomplished with three types of developmental opportunities: institutional training and education, operational assignments, and self-development. Army personnel have indicated that a greater level of organizational support is necessary to ensure that the Army self-development system is effective (Bryant, 1994; Snow, 2003). The provision of performance appraisal feedback is one type of organizational support that may facilitate effective self-development in the Army. Specifically, feedback has the capability to help Soldiers accurately identify particular knowledge or skills in need of improvement. Performance feedback can also aid Soldiers in developing a specific plan of action regarding the particular self-development activities to pursue in order to develop these identified weaknesses.

Indeed, several Army publications, such as the *DA PAM 350-58* and the *FM 6-22 – Army Leadership: Competent, Confident, and Agile* (2006), acknowledge that self-development is a shared responsibility between the subordinate and his/her leader. The *DA PAM 350-58* states that a leader should aid his/her subordinate in the preparation of development action plans in order to map self-development efforts to the subordinate's specific individual goals and needs, as well as to help the subordinate set priorities for improving his/her performance. While the supervisor/leader's role in the self-development process is acknowledged in such Army doctrine, Snow (2003) argues that in practice Army leaders are not fulfilling this responsibility. Specifically, he suggests that Army leaders need to become more adept at assessing subordinates' strengths and weaknesses and sharing this developmental feedback with their subordinates. Snow also suggests that the Army needs to devote more resources/education to Army leaders on individual assessment and feedback techniques. The results of the present research may provide such guidance concerning the *best practices* or optimal techniques for providing supervisory performance feedback in order to enhance the quality of employees' self-development choices. This information could be used to develop the instructional content of performance appraisal training/education for Army leaders.

While providing highly severe feedback was found to be detrimental to employees' self-development activity choices, the provision of constructive negative feedback, where warranted, is clearly crucial to improve the effectiveness of Army personnel. This research suggests that leaders pair down the amount of negative feedback provided by highlighting only a few performance areas most in need of attention. This negative feedback should be coupled with explicit direction for strengthening these identified areas, such as suggestions of appropriate self-development activities to pursue. Further, positive aspects of performance should be highlighted and the feedback should be stated in behavioral terms.

Finally, given the direct influence of development-focused feedback on self-development quality, it may be particularly valuable for the U.S. Army to keep leaders informed concerning quality development resources available to Soldiers. Thus, leaders would have a "pool" of high quality resources in which to draw when providing a subordinate with an appropriate self-development activity suggestion. The Army has initiated efforts to provide such self-development resources, for example, self-development resource websites have been created (e.g., the *Leader Development Portfolio* available at https://www.benchworks.army.mil/). While provision of such online resources is valuable, it may also be beneficial to provide leaders with training/education concerning on how to best utilize these resources in order to locate the most appropriate self-development experiences for their subordinates.

Summary of Recommendations

Recommendations for Army Leaders:

- When giving performance feedback:
    - Include specific task-based examples of the employee's strengths and deficiencies.
    - Include specific suggestions of future development goals and self-development activities the employee could complete to address their performance weaknesses.
    - Discuss both the employee's performance weaknesses/development needs and performance strengths; limit your critique of their weaknesses to 2-3 priority areas.
- Encourage your subordinates to self-develop and provide verbal recognition to those who choose to engage in self-development. Employees often report that they would like a greater degree of recognition and guidance with respect to their self-development efforts.

Recommendations for the Army:

- Provide leaders with training (or refresher training) on how to write and deliver an effective performance evaluation. This is particularly important for new leaders/supervisors.
- Brief all Soldiers on what characterizes a higher quality development activity. This should help Soldiers make more informed choices concerning their self-development.
- Disseminate information to all Soldiers about development opportunities available.
    - Providing Army leaders with this information will give them a "pool" of self-development resources in which to draw when providing a subordinate with an appropriate self-development activity suggestion on their performance evaluation.

Conclusion

In conclusion, meaningful development in an individual's job knowledge and skills is contingent on the quality of self-development activities in which one participates, not simply the quantity of self-development. Accordingly, to maximize the benefits of employee self-development, the U.S. Army (and other organizations) must understand the antecedents that influence the appropriateness of employees' self-development choices. The results of this research demonstrate that supervisors/leaders have the capability to positively shape their subordinate's self-development choices by providing appropriate performance appraisal feedback. This research, however, is only the first step in understanding key antecedents that enhance self-development quality; continued research is warranted.

REFERENCES

Anderson, J. G., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychology Bulletin, 103,* 411-423.

Antonioni, D. (1996). Designing an effective 360-degree appraisal feedback process. *Organizational Dynamics*, *25*, 24–38.

ATLDP Office Chief of Staff of the Army. (2001). *Army Training and Leader Development (ATLDP) Report*. Washington, D.C.: Department of the Army.

Atwater, L., Roush, P., & Fischthal, A. (1995). The influence of upward feedback on self- and follower ratings of leadership. *Personnel Psychology, 48*, 35-59.

Atwater, L. E., & Yammarino, F. J. (1997). Self-other agreement: A review and model. In G. R. Ferris (Ed.), *Research in personnel and human resources management* (Vol. 5, pp. 121-174). Greenwich, CT: JAI Press.

Azevedo, R., & Bernard, R. M. (1995). A meta-analysis of the effects of feedback in computer-based instruction. *Journal of Educational Computing Research, 13*, 111-127.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*, 191–215.

Bandura, A. (1978). The self system in reciprocal determinism. *American Psychologist, 33*, 344-358.

Bandura, A. (1986). *Social foundations of thought and action*. Englewood Cliffs: Prentice-Hall.

Bandura, A., & Cervone, D. (1983). Self-evaluative and self-efficacy mechanisms governing the motivational effects of goal systems. *Journal of Personality and Social Psychology, 45*, 1017-1028.

Bandura, A., & Cervone, D. (1986). Differential engagement in self-reactive influences in cognitive motivation. *Organizational Behavior and Human Decision Processes, 38*, 92-113.

Bandura, A., Cioffi, D., Taylor, C. B., & Brouillard, M. E. (1988). Perceived self-efficacy in coping with cognitive stressors and opioid activation. *Journal of Personality and Social Psychology, 55* (3), 479-488.

Baron, R. A. (1988). Negative effects of destructive criticism: Impact on conflict, self-efficacy, and task performance. *Journal of Applied Psychology, 73* (2), 199-207.

Betz, N. E., & Hackett, G. (1983). The relationship of mathematics self-efficacy expectations to the selection of science-based college majors. *Journal of Vocational Behavior, 23*, 329-345.

Birdi, K., Allan, C., & Warr, P. (1997). Correlates and perceived outcomes of four types of employee development activity. *Journal of Applied Psychology, 82* (6), 845-857.

Boyce, L. A. (2004). Propensity for self-development of leadership attributes: Understanding, predicting, and supporting leader self-development performance. (Doctoral dissertation, George Mason University, 2004). *Dissertation Abstracts International, 65*(1-B), 468.

Boyce, L. A., Wisecarver, M. M., & Zaccaro, S. J. (2005). *Understanding, predicting, and supporting leader self-development.* (Technical Report, No. 1173). Arlington, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.

Brett, J. F., & Atwater, L. E. (2001). 360º feedback: Accuracy, reactions, and perceptions of usefulness. *Journal of Applied Psychology, 86* (5), 930-942.

Briggs, L. J. (1977). *Instructional design: Principles and applications*. Englewood Cliffs, NJ: Educational Technology Publications.

Brookfield, S. (1984). Self-directed adult learning: A critical paradigm. *Adult Education Quarterly, 35* (2), 59-71.

Brookfield, S. (1985). *Self-directed learning: From theory to practice*. San Francisco: Jossey-Bass.

Brown, K. G., & Ford, J. K. (2002). Technology in training: Building an infrastructure for active learning. In K. Kraiger (Ed.), *Creating, implementing, and managing effective training and development: State-of-the-art lessons for practice* (pp. 192-233). San Francisco, CA: Jossey-Bass.

Bryant, C. D. (1994). *Strategies for augmentation initiatives for leadership self-development program* (ARI Research Note 94-29; DTIC ADA285307). Arlington, VA: United States Army Research Institute for the Behavioral and Social Sciences.

Burke, R. J., Weitzel, W., & Weir, T. (1978). Characteristics of effective employee performance review and development interviews: Replication and extension. *Personnel Psychology, 31*, 903-919.

Burke, R. J., & Wilcox, D. S. (1969). Characteristics of effective employee performance review and development interviews. *Personnel Psychology, 22*, 291-305.

Caffarella, R. S., & O'Donnell, J. M. (1991). Judging the quality of work-related, self-directed learning. *Adult Education Quarterly, 42* (1), 17-29.

Campbell, J. P., & Kuncel, N. R. (2001). Individual and team training. In N. Anderson, D. S. Ones, H. K. Sinangil, & C. Viswesvaran (Eds.), *Handbook of industrial, work, and organizational psychology* (Vol. 1, pp. 278-312). Thousand Oaks, CA: Sage Publications.

Cervone, D., Jiwani, N., & Wood, R. (1991). Goal setting and the differential influence of self-regulatory processes on complex decision-making performance. *Journal of Personality and Social Psychology, 61* (2), 257-266.

Collins, J. L. (1982, March). *Self-efficacy and ability in achievement behavior*. Paper presented at the annual meeting of the American Educational Research Association, NY.

Colquitt, J. S., & Simmering, M. J. (1998). Conscientiousness, goal orientation, and motivation to learn during the learning process: A longitudinal study. *Journal of Applied Psychology, 83*, 654-665.

Confessore, S. J. (1992). Self-directed learning in the workplace. In G. J. Confessore, & S. J. Confessore (Eds.), *Guideposts to self-directed learning. Expert commentary on essential concepts.* King of Prussia, PA: Organizational Design and Development, Inc.

Cooley, C. H. (1902). *Human nature and the social order* (Rev. Ed.). New York: Scribner's.

Coolican, P. M. (1974). *Self-planned learning: implications for the future of adult learning.* Technical Report No. 74-307. Syracuse, NY: Syracuse University (ERIC Document Reproduction Service No. ED 095 254).

Department of the Army. (1994). *Department of the Army Pamphlet 350-58, Leader Development for America's Army – The Enduring Legacy*. Washington, D.C.: Government Printing Office.

Department of the Army. (2006). *Field Manual 6-22 – Army Leadership: Competent, Confident, and Agile*. Washington, D.C.: Government Printing Office.

Ellinger, A.D. (2004). The concept of self-directed learning and its implications for human resource development. *Advances in Developing Human Resources, 6* (2), 158-177.

Fedor, D. B. (1991). Recipient responses to performance feedback: A proposed model and its implications. In G. R. Ferris & K. M. Rowland (Eds.), *Research in personnel and human resource management* (Vol. 9, pp. 73-120). Greenwich, CT: JAI Press.

Fisher, S. L. & Ford, J. K. (1998). Differential effects of learner effort goal orientation on two learning outcomes. *Personnel Psychology, 51*, 397-419.

Ford, J. K., & Noe, R. A. (1987). Self-assessed training needs: The effects of attitudes towards training, managerial level, and function. *Personnel Psychology, 40*, 39-53.

Frayne, C. A., & Latham, G. P. (1987). The application of social learning theory to employee self-management of attendance. *Journal of Applied Psychology, 72*, 387-392.

Gagne, R. M., & Briggs, L. J. (1979). *Principles of instructional design*. New York: Holt, Rinehart and Winston.

Gagne, R. M., & Medsker, K. L. (1996). *The conditions of learning*. Orlando: Harcourt Brace.

Garet, M. S., Porter, A. C., Desimone, L., Birman, B. F., & Yoon, K. S. (2001). What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal, 38* (4), 915-945.

Garrison, D. R. (1997). Self-directed learning: Toward a comprehensive model. *Adult Education Quarterly, 48* (1), 18-33.

Gist, M. E., & Mitchell, T. R. (1992). Self-efficacy: A theoretical analysis of its determinants and malleability. *Academy of Management Review, 17* (2), 183-211.

Glaser, R. (1990). The reemergence of learning theory within instructional research. *American Psychologist, 45* (1), 29-39.

Goldstein, I. L. & Ford, J. K. (2002). *Training in organizations: Needs assessment, development, and evaluation.* Belmont, CA: Wadsworth Thomson Learning.

Guthrie, V. A., & King, S. N. (2004). Feedback-intensive programs. In C. D. McCauley, & E. Van Velsor (Eds.), *The Center for Creative Leadership: Handbook of leadership development* (pp. 25-57). San Francisco, CA: Jossey-Bass.

Hanson, P. G., Morton, R. B., & Rothaus, P. (1963). The fate of role stereotypes in two performance appraisal interviews. *Personnel, 16*, 269-280.

Harris, M. H., & Schaubroeck, J. (1998). A meta-analysis of self-supervisory, self-peer, peer-supervisor ratings. *Personnel Psychology, 41*, 43-62.

Hayduk, L. A. (1987). *Structural equation modeling with LISREL: Essentials and advances.* Baltimore: The John Hopkins University Press.

Hazucha, J., Hezlett, S., & Schneider, R. (1993). The impact of 360-degree feedback on management skills development. *Human Resource Management, 32*, 325-351.

Hoyle, R. H. (1995). *Structural equation modeling: Concepts, issues, and applications.* Thousand Oaks, CA: Sage Publications.

Ilgen, D. R., Fisher, C. D., & Taylor, M. S. (1979). Consequences of individual feedback on behavior in organizations. *Journal of Applied Psychology, 64* (4), 349-371.

Jacobs, B., Prentice-Dunn, S., & Rogers, R. (1984). Understanding persistence: An interface of control theory and self-efficacy theory. *Basic and Applied Social Psychology, 5*(4), 333-347.

Jacobs, M., Jacobs, A., Feldman, G., & Cavior, N. (1973). Feedback II – the credibility gap: Delivery of positive and negative emotional and behavior feedback in groups. *Journal of Consulting and Clinical Psychology, 41*, 215-223.

Janoff-Bulman, R., & Brickman, P. (1982). Expectations and what people learn from failure. In N. Feather (Ed.), *Expectations and actions* (pp. 207-230). Hillsdale: Lawrence Earlbaum.

Jöreskog, K., & Sörbom, D. (1993). *LISREL 8 user's guide*. Uppsala, Sweden: University of Uppsala.

Kanfer, R. (1990). Motivation theory in industrial and organizational psychology. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (2nd ed., Vol. 1, pp. 75-170). Palo Alto, CA: Consulting Psychologists Press.

Kanfer, R., & Ackerman, P. L. (1989). Motivation and cognitive abilities: An integrative/aptitude-treatment interaction approach to skill acquisition. *Journal of Applied Psychology, 74*, 657-690.

Karrasch, A. I. (2006). *The Army leader assessment and feedback pilot program.* (Technical Report, No. 2006-1). Fort Leavenworth, KS: Center for Army Leadership.

Karrasch, A. I., & Halpin, S. M . (1999). *Feedback on 360 degree leader AZIMUTH check assessment conducted at Fort Clayton, Panama.* (Research Note, No. 99-21). Arlington, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.

Kinicki, A. J., Prussia, G. E., Wu, B., & McKee-Ryan, F. M. (2004). A covariance structure analysis of employees' response to performance feedback. *Journal of Applied Psychology, 89* (6), 1057-1069.

Kluger, A. N., & DeNisi, A. (1996). The effects of feedback interventions on performance: A historical review, a meta-analysis and a preliminary feedback intervention theory. *Psychological Bulletin, 119*, 254-284.

Knowles, M. S. (1980). *The modern practice of adult education: Andragogy versus pedagogy*. New York: Association Press.

Kozlowski, S., & Hults, B. (1987). An exploration of climates for technical updating and performance. *Personnel Psychology, 40*, 539-563.

Kraiger, K. (2003). Perspectives on training and development. In W. Borman, D. Ilgen, R. Klimoski (Eds.), *Handbook of psychology* (pp. 171-192). Hoboken, NJ: John Wiley & Sons.

Larson, J. R. (1984). The performance feedback process: A preliminary model. *Organizational Behavior and Human Performance, 33* (1), 42-76.

Latham, G. P., & Locke, E. A. (1991). Self-regulation through goal setting. *Organizational Behavior and Human Decision Processes, 50*, 212-247.

Locke, E. A., Cartledge, N., & Knerr, C. S. (1970). Studies of the relationship between satisfaction, goal-setting, and performance. *Organizational Behavior and Human Performance, 5* (2), 135-158.

London, M., & Smither, J. W. (1999). Empowered self-development and continuous learning. *Human Resource Management, 38* (1), 3-15.

Macey, W. H. (1996). Dealing with the data: Collection, processing, and analysis. In A. I. Kraut (Ed.), *Organizational surveys: Tools for assessment and change* (pp. 204-232). San Francisco: Jossey-Bass.

Martin, S. L., & Klimoski, R. J. (1990). Use of verbal protocols to trace cognitions associated with self- and supervisor evaluations of performance. *Organizational Behavior and Human Decision Processes, 46*, 135-154.

Maurer, T. J., Mitchell, D., & Barbeite, F. G. (2002). Predictors of attitudes toward a 360-degree feedback system and involvement in post-feedback management development activity. *Journal of Occupational and Organizational Psychology, 75*, 87-107.

Maurer, T. J., & Tarulli, B. A. (1994). Investigation of perceived environment, perceived outcome, and person variables in relationship to voluntary development activity by employees. *Journal of Applied Psychology, 79* (1), 3-14.

Maurer, T. J., Weiss, E. M., & Barbeite, F. G. (2003). A model of involvement in work-related learning and development activity: The effects of individual, situational, motivation, and age variables. *Journal of Applied Psychology, 88* (4), 707-724.

McCauley, C. D., Eastman, L. J., & Ohlott, P. J. (1995). Linking management selection and development through stretch assignments. *Human Resource Management, 34* (1), 93-115.

Mead, G. H. (1934). *Mind, self, and society*. Chicago: University of Chicago Press.

Meyer, H. H., Kay, E., & French, J. R. (1965). Split roles in performance appraisal. *Harvard Business Review, 43*, 123-129.

Milkulincer, M. (1988). Reactance and helplessness following exposure to unsolvable problems: The effects of attributional style. *Journal of Personality and Social Psychology, 54*, 679–686.

Milkulincer, M. (1989). Coping and learned helplessness: Effects of coping strategies on performance following unsolvable problems. *European Journal of Personality, 3*, 181-194.

Nathan, B. R., Mohrman, A. H., Jr., & Milliman, J. (1991). Interpersonal relations as a context for the effects of appraisal interviews on performance and satisfaction: A longitudinal study. *Academy of Management Journal, 34*, 352-369.

Noe, R. A. (1996). Is career management related to employee development and performance? *Journal of Organizational Behavior, 17*, 119-133.

Noe, R. A., & Colquitt, J. A. (2002). Planning for training impact: Principles of training effectiveness. In K. Kraiger (Ed.), *Creating, implementing, and managing effective training and development: State-of-the-art lessons for practice*. San Francisco, CA: Jossey-Bass.

Noe, R. A., & Wilk, S. A. (1993). Investigation of the factors that influence employees' participation in development activities. *Journal of Applied Psychology, 78*, 291-302.

Pescuric, A., & Byham, W. C. (1996). When unveiled 20 years ago, behavior modeling was predicted to do wonders for training. It has. And, now, an enhanced version is keeping up with our changing times. *Training and Development, July*, 25-30.

Prussia, G. E., & Kinicki, A. J. (1996). A motivational investigation of group effectiveness using social cognitive theory. *Journal of Applied Psychology, 81*, 187-199.

Reilly, R. R., Smither, J. W., & Vasilopoulos, N. L. (1996). A longitudinal study of upward feedback. *Personnel Psychology, 49* (3), 599-612.

Rigney, J. W., Munro, A., & Crook, D. E. (1979). Teaching task-oriented selective reading. A learning strategy. In H. F. O'Neil, Jr., & C. D. Spielberger (Eds.), *Cognitive and affective learning strategies* (pp. 177-206). New York: Academic Press.

Rose, D., & Farrell, T. (April, 2002). *The use and abuse of comments in 360-degree feedback.* Paper presented at the 18th Annual Conference of the Society for Industrial and Organizational Psychology, Toronto, Ontario, Canada.

Rothkopf, E., & Billington, M. (1979). Goal-guided learning from text: Inferring a descriptive processing model from inspection times and eye movements. *Journal of Educational Psychology, 71*, 310-327.

Roush, P., & Atwater, L. (1992). Using the MBTI to understand transformational leadership and self-perception accuracy. *Military Psychology, 4*, 17-34.

Rovero, J. L., & Bullis, R. C. (1998). Assessing self-development. *Military Review, 78*, 35-40.

Schmidt, A. M., & Ford, J. K. (2003). Learning within a learner control training environment: The interactive effects of goal orientation and metacognitive instruction on learning outcomes. *Personnel Psychology, 56*, 405-429.

Schumacker, R. E., & Lomax, R. G. (1996). *A beginner's guide to structural equation modeling*. Mahwah, NJ: Lawrence Erlbaum Associates.

Schunk, D. H. (1983). Ability versus effort attributional feedback: Differential effects of self-efficacy and achievement. *Journal of Educational Psychology, 75*, 848-856.

Shrauger, J. S., & Schoeneman, T. J. (1979). Symbolic interactionist view of self-concept: Through the looking glass darkly. *Psychological Bulletin, 86* (3), 549-573.

Shrout, P. E., & Fleiss, J. L. (1979). Intraclass correlations: Uses in assessing rater reliability. *Psychological Bulletin, 86* (2), 420-428.

Shute, V. J., Gawlick, L. A., & Gluck, K. A. (1998). Effects of practice and learner control on short- and long-term gain and efficiency. *Human Factors, 40* (2), 296-310.

Smither, J. W., & Walker, A. G. (2004). Are the characteristics of narrative comments related to improvement in multirater feedback rating over time? *Journal of Applied Psychology, 89* (3), 575-581.

Snow, J. J. (2003). *Self-development: An important aspect of leader development*. (Strategy Research Project, DTIC ADA414546). Carlisle, PA: United States Army War College.

Snow, R. E. (1989). Aptitude-treatment interaction as a framework for research on individual differences in learning. In P. L. Ackerman, R. J. Sternberg, & R. Glaser (Eds.), *Learning and individual differences: Advances in theory and research* (pp. 13-59). New York: Freeman.

Snow, R. E., & Lohman, D. F. (1984). Toward a theory of cognitive aptitude for learning from instruction. *Journal of Educational Psychology, 76*, 347-376.

Taylor, M. (1981). The motivational effects of task challenge: A laboratory investigation. *Organizational Behavior and Human Performance, 27*, 255-278.

Taylor, M. S., Fisher, C. D., & Ilgen, D. R. (1984). Individuals' reactions to performance feedback in organizations: A control theory perspective. In K. M. Rowland & G. R. Ferris (Eds.), *Research in Personnel and Human Resources Management* (pp. 81-124) Greenwich, CT: JAI Press.

Tennyson, R. D., & Breuer, K. (1997). Psychological foundations for instructional design theory. In R. D. Tennyson, F. Schott, N. Seel, & S. Dijkstra (Eds.), *Instructional design: International perspectives*. Mahwah, NJ: Lawrence Erlbaum Associates.

Thornton, G. C. (1968). The relationship between supervisory- and self-appraisals of executive performance. *Personnel Psychology, 21*, 441-455.

Tough, A. (1971). *The Adult's Learning Projects.* Toronto: Ontario Institute for Studies in Education.

Tough, A. (1978). Major learning efforts: Recent research and future directions. *Adult Education, 28*, 250-263.

Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational Research Methods, 3* (1), 4-69.

Vandewalle, D. (1997). Development and validation of a work domain goal orientation instrument. *Educational and Psychological Measurement, 57*, 995-1015.

Van Velsor, E., & McCauley, C. D. (2004). Our view of leadership development. In C. D. McCauley, & E. Van Velsor (Eds.), *The Center for Creative Leadership: Handbook of leadership development* (pp. 1-22). San Francisco, CA: Jossey-Bass.

Van Velsor, E., Taylor, S., & Leslie, J. (1993). An examination of the relationships between self-perception accuracy, self-awareness, gender and leader effectiveness. *Human Resource Management, 32*, 249-264.

Wexley, K. N. (1984). Personnel training. *Annual Review of Psychology, 35*, 519-551. Palo Alto, CA: Annual Reviews.

Williams, L. J., & Anderson, S. E. (1994). An alternative approach to method effects by using latent-variable models: Applications in organizational behavior research. *Journal of Applied Psychology, 79* (3), 323-331.

Wood, R., & Bandura, A. (1989). Impact of conceptions of ability on self-regulatory mechanisms and complex decision making. *Journal of Personality and Social Psychology, 56* (3), 407-415.

Zimmerman, B. J. (1998). Developing self-fulfilling cycles of academic regulation: An analysis of exemplary instructional models. In D. H. Schunk & B. J. Zimmerman (Eds.), *Self-regulated learning: From teaching to self reflective practice* (pp. 1-19). New York: Guilford Press.

APPENDIX

Self-Dissatisfaction scale
Response options: 1 *(very dissatisfied)* to 5 *(very satisfied)*

1. How dissatisfied/satisfied would you be if you were to make no gains in your job knowledge or skills by your next performance evaluation?
2. How dissatisfied/satisfied would you be if your performance on the job has not improved by your next performance evaluation?

Self-efficacy for Self-Development scale
Response options: 1 *(strongly disagree)* to 5 *(strongly agree)*

1. I can increase my job knowledge or skills beyond their current levels by performing self-development activities.
2. My performance on the job could be improved by participating in self-development activities.
3. I feel confident in my ability to successfully improve my job knowledge or skills by performing self-development activities.

Learning Goal Orientation scale
Response options: 1 *(strongly disagree)* to 5 *(strongly agree)*

1. I am willing to select a challenging work assignment that I can learn a lot from.
2. I often look for opportunities to develop new skills and knowledge.
3. I enjoy challenging and difficult tasks at work where I'll learn new skills.
4. For me, development of my work ability is important enough to take risks.
5. I prefer to work in situations that require a high level of ability and talent.